

Zero Retries issue 0199 2025-04-25

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fourth year of publication, with ~~2600+~~ 2700+ subscribers.

About Zero Retries

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Web version of this issue - <https://www.zeroretries.org/p/zero-retries-0199>

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Request To Send

Commentary by Editor Steve Stroh N8GNJ

Paid Subscribers Update

My thanks to **Andrew Herrington KG5JNC** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 27** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Victoria Yanovich K8VSY** for one year of being a **Paid Subscriber** to Zero Retries as of 2025-03 (deferred mention - *apologies*)!

Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.

##

2700 Zero Retries Email Subscribers!

The uptick in Zero Retries subscribers rose noticeably this week to surpass 2700 after the nice mention of the Zero Retries Digital Conference 2025 in Amateur Radio Newslines Report 2477, and Monday's webinar (see the first feature story).

My usual disclaimer applies - the actual regular readership of Zero Retries is greater than the email subscriber number, including "followers" on Substack (still a mysterious concept to me, but that's Substack), those following via RSS feed, and those following via Mastodon and Bluesky social media.

##

Remember that Reply Comments on FCC GN 25-133 are due Monday, 2025-04-28

Please join me in submitting substantive replies, especially to endorse those, like the ARRL's comments, that were constructive and forward-looking. With some grace, I'll have my Reply Comments ready in time for Zero Retries 0199 next Friday. It's been a too-busy week so I didn't get this done in time for publication, but will be doing so over the weekend, sandwiching that into the evenings after the fun of LinuxFest Northwest (see below).

##

Presentations Are A Muscle (Practiced Skill)

To those many / most who just did an eye roll reading that title, what can I say - I'm late to this realization. I've done perhaps... 25 presentations to large-ish crowds in my lifetime. While I've practiced almost all of them, presentations still aren't easy for me... until last Monday. Something *clicked* with the JFMDNA webinar, and I think that the "click" was that I've finally (mentally) dialed in on an interesting story that I can tell with enthusiasm. Previously, even when I've presented on something from my direct experience, it was focused on the specific request / topic rather than a broader story that I wanted to tell / was more comfortable telling.

In the JFMDNA webinar, I told the story of how I started Zero Retries, discoveries I made along the way, and how all of that resulted in being at the right place at the right time with the right background to create the IP400 Network Project with Martin Alcock VE6VH. The JFMDNA presentation just "felt right" and was easy and fun to tell, and I intend to reprise that story, and do it better, in future opportunities.

In practicing for the JFMDNA webinar, I also discovered that Apple's [Keynote](#) presentation app on Mac has a wonderfully easy and intuitive capability to record a narrated slide deck presentation. Keynote... wow. It just *worked*¹.

In Keynote, I was able to record, and replay, and in my experimentation I discovered that you can just export the recorded session into an MP4 video file.

For me, it doesn't *need* to get any easier than what's available in Keynote. This opens up a number of possibilities for me to record tightly focused presentations to be able to drill down on subjects instead of waiting for invitations to do presentations. I can even anticipate doing video summaries of Zero Retries issues. (Soon, but not immediately.)

See the feature story below on the JFMDNA webinar for more detail.

##

Phasing in a new Email Address for Zero Retries

This has been long in preparation, but beginning in this issue, I will begin using a new email address:

steve@zeroretires.net

for my work involving Zero Retries. I'm not discontinuing the use of my personal email address which I've been using since I began Zero Retries, but when I transition Zero Retries to a new publishing platform, the new email address will be the only email address associated with Zero Retries. If you email me about Zero Retries from my other email address, I'll be trying to reply from the new address.

##

LinuxFest Northwest This Weekend

On Saturday and Sunday I will be attending [LinuxFest Northwest](#) at the nearby Bellingham Technical College here in Bellingham, Washington, USA. As long time Zero readers have gleaned from various mentions, I consider myself "conversant" in Linux, but my skills are nothing resembling comfortable or very capable in Linux. Thus my annual pilgrimage to LinuxFest Northwest is part educational, part inspirational, and part "support the local tech conference". Another factor is that now that I'm in the "conference business" (with my wife Tina KD7WSF for the Zero Retries Digital Conference - 2025-09-13), I'm going to be taking a lot more notice of the logistics. One thing LinuxFest Northwest does really well is engage a large community of volunteers and has worked out a cooperative arrangement with Bellingham Technical College for the use of its campus center buildings and a number of classrooms.

At LinuxFest Northwest 2024, I did a presentation about Amateur Radio. That presentation was well-received (I was later told that the room was at capacity and folks had to be turned away). But, I didn't detect that it made much of a difference in influencing LinuxFest Northwest attendees, especially local Linux techies, to get involved with Amateur Radio. Thus I decided not to offer to do another such presentation at LinuxFest this year. But after my JFMDNA webinar on Monday, I've kind of found a groove in doing presentations - see the feature article below.

##

Request for Zero Retries Readers Who Are Also Involved with GNU Radio Development

I'd like to get in touch with Zero Retries readers who are involved in both Amateur Radio / Zero Retries Interesting activities *and* GNU Radio. My intent is that **Zero Retries Interesting aspects of Amateur Radio** be reasonably represented at GNU Radio Conference 2025. GRCon will be held 2025-09-08 thru 12, in Everett, Washington USA. A "cool Amateur Radio" exhibit table? Demonstrations of Amateur Radio Software Defined Transceivers? A Software Defined *Repeater*? At this early stage of GRCon 2025 planning, nearly anything is possible. I'm a local volunteer for GRCon 2025 and have a bit of influence in trying to make GRCon 2025 the best one ever (so GNU Radio will be tempted to return to the Pacific Northwest for future conferences).

Of course, Zero Retries Digital Conference 2025 will be held the day after GRCon concludes - Saturday September 13, 2025 for those that are primarily interested in Zero Retries Interesting Amateur Radio topics. And anything related to Amateur Radio at GRCon 2025 will be very welcome to stick around be involved in ZRDC 2025!

My goal behind this request is that I would like to see Amateur Radio be represented to those that are only going to be at GRCon 2025, especially those that are going to attend for just a few days of the conference.

GRCon 2025 will be a bit unique versus past GRCons in that it is being held on the US West Coast (most have been East Coast / South / Midwest) and thus GRCon will be more approachable to those on the West Coast, especially in the Pacific Northwest such as Portland, Oregon and Seattle, Washington.

If you'd like to help me strategize about this possibility, please drop me an email at my shiny new *GNU Radio email address* - steves@gnuradio.org. I would appreciate your insights!

##

My First Column Submitted For The Communicator

Following my own advice - Write for SARC's The Communicator, I submitted my first column for the May / June 2025 issue of The Communicator titled **An Introduction to the IP400 Network Project**. TC's Editor John Schouten VE7TI was very easy to work with (especially given that my first submission crowded the deadline for the May / June 2025 issue). VE7TI turned around a "proof copy" of my article formatted for inclusion into The Communicator in a day and it looks great, including this generous introduction:

Starting this issue, The Communicator welcomes Steve N8GNJ as a columnist. I have been a reader of his blog for some time and I think that you will find his topics interesting and on the cutting edge of Amateur Radio. - Ed.

In my JFMDNA webinar on Monday, I mentioned that I consider The Communicator an excellent publication it's the primary publication I recommend for an introduction to Amateur Radio. It's an excellent publication, features a wide range of topics within Amateur Radio (including several that are Zero Retries Interesting in every issue), and it's not restricted behind a paywall, thus both discoverable and readable by anyone, anywhere in the world interested in Amateur Radio.

I'll link to the next issue of The Communicator as soon as it publishes.

##

Have a great weekend, all of you co-conspirators in Zero Retries Interesting Amateur Radio activities!

Steve N8GNJ

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JFMDNA

Jim Fisher Memorial Digital Network Association



Logo courtesy of Jim Fisher Memorial Digital Network Association

Jim Fisher Memorial Digital Network Association Webinar - IP400 and the *Digital* Future of Amateur Radio

By Steve Stroh N8GNJ

On Monday evening 2025-04-21 I was privileged to be the *inaugural* presenter for what will be a series of webinars by the [Jim Fisher Memorial Digital Network Association \(JFMDNA\)](#) on topics relating to their mission.

The Association was created for the purpose of enhancing amateur radio digital communications particularly through the buildout of MESH networks. The mission of the association is to expand upon the existing MESH network deployed throughout Montgomery County by building out capacity into adjacent counties and beyond—an area commonly described as the five county Philadelphia metropolitan area.

Kudos to Bill Telford WB3CQK for getting the JFMDNA webinar set up in Zoom. In my simplistic use of Zoom, I wasn't aware of the [webinar capability](#) which makes presentations to larger groups (at the peak, there were about 75 viewers) a lot saner by limiting the audience to “view only, plus text chat”, and only the presenters and manager's video (and audio) is displayed.

I was given an incredibly generous introduction by Steven Davidson K3FZT, who *not* coincidentally is **Zero Retries Founding Member 0000**. Transcript text by YouTube, formatting and cleanup by this lowly human:

Well thank you Bill and welcome again. I've been part of the team producing this webinar and Steve Stroh asked me to introduce him. I'm proud and happy to do so. When I first came across Zero Retries issue number 18 back in November 2021 I felt as though I'd been struck by lightning. Here was a fella who was reading my mind. Yet he was from an advanced civilization and knew so much more about everything in radio and data communication than I had even imagined.

Each issue of Zero Retries brought new ways of thinking about radio communication and its growing nexus with digital technologies and data communication. My excitement only grew. I met Steve in real life at Hamvention in May 2022 and we sat and chatted for some time. Among many other topics I asserted that his newsletter was valuable and that Hams would pay for it. I later put my money where my mouth was and became founding subscriber zero because in the digital data world we start counting at zero. I am inordinately proud of having been out in front on this. Steve and Martin Alcock VE6VH have brought IP400 into the world and it looks to become a fabulous tool for data communication. Without further ado, please welcome Steve.

The webinar went well. After I completed my slide deck, I was joined on the webinar by my co-conspirator in the IP400 Network Project - Martin Alcock VE6VH who upstaged me by showing off some working IP400 prototype hardware, and some behind the scenes looks at the code bases, specification documents, etc. per participant requests.

There were a few minor things that I should have included in my presentation that only occurred to me afterward after watching the video and from the questions. Briefly:

- Northwest Amateur Packet Radio Association's newsletter **Zero Retries** (the original) [is now online](#), thanks to Digital Library of Amateur Radio & Communications. Man I learned a lot from reading those (and being one of the Editors).
- I talked about the formative influence of my experience with the 9600 bps bit regenerative repeater network in the Seattle area on both me personally and my concepts of SuperPeaters and IP400. I wrote an article that explained the details of the Puget Sound Amateur Radio TCP/IP Network - [The Puget Sound Amateur Radio TCP/IP Network \(Circa 1995\)](#).
- My strong statement about [Starlink](#) being more usable for some emergency communications situations than Amateur Radio was formed from personal experience. Concurrent with ARRL Field Day 2023, I did an [experiment I called Meadow Day](#) where I took my Starlink unit out into the middle of my big yard and used it with a solar panel and battery unit and did a series of video and audio tests. No dependencies (other than a nearby bathroom and sunlight.) It worked great! Keep in mind this was before the [Starlink Mini](#) was available, and I think the “Mini” *completely changes the paradigm* of emergency communications.
- When I find one, I like to tell unusual stories that are related to Amateur Radio. One that I'm particularly proud of was in **Zero Retries 0064** - The “Kind of” Amateur Radio Backstory of Apple's “Emergency SOS Via Satellite” Feature.
- In **Zero Retries 0183**, I did a “mostly fiction” story as a Christmas present to Zero Retries readers - Paying it Forward in Amateur Radio.
- I've done “snippets” of my strong arguments for use of Amateur Radio repeaters for data communications in various places... and why digipeaters were and are a hack and aren't a substitute for (full duplex Frequency Division Duplex) repeaters, but I've never gathered that together as a comprehensive article. The subject (and the future of Amateur Radio data communications) really deserves such a treatment.
- I was asked how IP400 will interface with legacy packet radio networks. Primarily IP400 will “encapsulate” nearly any digital data, transport it through an IP400 network, and “unencapsulate” it at the other end. But a better example of such transitions between systems is the [JNOS router](#) which is already fully capable of TCP/IP v4 (and recently, v6, I think) interoperability with AX.25 including various AX.25 networks.

As I discussed in Request to Send, this webinar really energized me and I think that such a format will be a valuable adjunct or extension of the Zero Retries mission:

[Promote] technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology.

Again, my Thanks to Bill Telford WB3CQK and Steven Davidson K3FZT for inviting me to speak to JFMDNA. I hope to do so again in the future after IP400 has advanced beyond the development phase, especially some of the future features and capabilities that Martin and I discussed.

Both the YouTube video of my presentation and the slide deck of my presentation can be viewed at:

<https://www.jfmdna.org/webinars/>

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Problems Reported with Early HF Signals zBitx Units

By Steve Stroh N8GNJ

I'm a fan of the innovative, software-defined [HF Signals zBitx](#) portable HF radio (it's built around a Raspberry Pi Zero 2 W) since it became available for sale earlier this year. I currently have one on order with HF Signals from the second round of production. But it appears there are several "early issues" with the zBitx that early buyers have discovered.

Apologies Zero Retries readers for my apparent over-enthusiasm for the zBitx, at least at this early stage of production of the unit.

I'm grateful to a Zero Retries reader who prefers to remain anonymous (hereafter, Reader X), for bringing these issues to my attention.

So far reports are lots of overheating issues (with several fried radios), the [RPi Zero 2 W] is too underpowered, it takes nearly 4A to transmit which sucks the batteries dry quickly, and there are electrical noise issues coming from the front display screen, in addition to quite a few software issues.

Reader X has been helpful in the past, and I have no reason to doubt them in telling me that these issues below are copied verbatim from the referenced Discord thread. In my opinion, the "Claim" / "Truth" verbiage is a bit inflammatory, (I would have used a phrase like "observed from actual use or other reference"). But on the other hand, the "Claims" are direct from HF Signals' website (at the time "Claim" / "Truth" was written).

Followup from Reader X:

Since you mentioned in your latest Zero Retries issue about FreeDV being a test for current [Software Defined] radios, we may need to consider removing the zBitx from that list, assuming that working decently is part of that test:

<https://discord.com/channels/1026361918505635890/1321830883329708064/1363900978021142608>

I want to address and clear up some false claims on HF Signals website for the zBitx. <https://www.hfsignals.com/index.php/zbitx/>

- **Claim:** The zBitx is a path breaking 5 watts, 64-bit integrated SDR radio.
 - *Truth:* The underlying OS is 32 bit, not 64 bit. 64 bit is only available on the fork/img file provided by the 64bit development team here for the sBitx.
- **Claim:** The zBitx is a CW dream machine for base station or field operations.
 - *Truth:* CW does not work well either with an external keyer or using the macros. It works fine with keyboard input. I wouldn't call it a dream machine since there are better CW transceivers on the market.
- **Claim:** SSB and AM modes are with integrated voice equalizer.
 - *Truth:* There is only a simple, bandwidth control for RX. There are no TX or RX equalizers, NR, or other filters available. This is only available on the fork provided by the 64bit development team here.
- **Claim:** The zBitx comes bundled with Fldigi, FreeDV, QSSTV. Any RigCtrl compatible, Linux software will work with the zBitx.
 - *Truth:* The zBitx comes with Fldigi, WSJTX, and QSSTV. FreeDV is not bundled in. The apps work slow and poorly on the zBitx.
- **Claim:** It is capable of 10 watts of power from two standard 18650 batteries.
 - *Truth:* The radio will not deliver 10 watts in any configuration. It is limited to 5 watts. See claim #1.
- **Claim:** Transmit Current consumption: 1.5 to 3A
 - *Truth:* Current consumption is up to 4.4A at 100 percent drive on some bands.

Solely from my perspective, these issues *are* concerning... but not damning. Being generous, sometimes products have hidden flaws that even extensive pre-production testing doesn't find. I certainly encountered this in my final paycheck job (and ended up neck deep in the fallout in my job as technical support). Such a situation is no fun, ever, and no company that values their reputation with current and future customers does such a thing deliberately.

But, HF Signals deserves a few knocks for "inflated claims" on their website such as 32-bit versus 64-bit OS included, transmit current being stated lower than actual, FreeDV "built in" when it's not actually included, etc. I also noted the single reference to 10 watts transmit power, when other references stated 5 watts transmit power.

In defense of HF Signals, *they are significantly pushing the state of the art* with the zBitx in this form factor, with this much functionality, and trying to deliver a "true SDR" - one in which the user can alter the function of the radio solely via software.

And especially doing all of that at a price point of **< \$200**. The zBitx is the first HF radio in a long time that has triggered *my* interest. Before the emergence of the zBitx, the only HF radio that I would consider buying new is the Icom IC-705 which is really sexy and portable, well designed, reliable, from a large established Amateur Radio company... but also costs [\\$1350](#). And it's not "true SDR" where the user can alter the function of the radio solely via software. And in lieu of FreeDV, Icom only offers only D-Star digital voice.

Thus the IC-705 is, effectively, not under consideration to those new Amateur Radio Operators coming in that want to experiment with radio technology, especially Software Defined Radio technology, on HF. No open source? No thanks.

As hinted from the "Claims / Truths", and confirmed by Reader X, the zBitx community is actively working on (hacking on) these issues, such as excessive heat buildup.

Finally Reader X pointed out that [HF Signals sBitx v3](#) is a mature product with larger enclosure, higher transmit power, and few issues (as of v3). That "v3" is telling, and indicates that with such products, from a company the scale of HF Signals, the learning curve resulting from feedback from actual

users is applied to the product. Oh, and the sBitx v3 is \$400 - 2x the price of the zBitx.

Reader X also mentioned that instead of the zBitx, they opted for a Xiegu HF radio (model not stated). But they will continue to follow the progress of the zBitx... as will I.

In the end I continue to applaud HF Signals for *attempting* the zBitx and making HF operation much more approachable to those who want to do Software Defined Radio experimentation, on HF, in a portable form factor. Sometimes things don't come out right the first time and you take your lumps, learn from the mistakes, *fix things as best as you can* (especially incorrect claims on your website), and keep going. Doing so earns you the respect of your current and future customers.

Having committed my purchase of a zBitx, after considering the issues above, I plan to maintain *my* order. Other folks like Reader X with zBitx orders in queue may well differ. For my part, the zBitx is my "fun splurge" for radio gear in 1H 2025 and I want to "vote with my wallet" to support what HF Signals is doing with the zBitx.

Of course, not having received it yet, the chaotic US tariff issues in 1H 2025 may intrude on my purchase; I'm just going to have to wait and see.

Lastly, to Reader X's point, yes, I'm going to have to revise my "Real Software Defined Radio test" with the zBitx as the benchmark, especially as it apparently doesn't include FreeDV out of the box.

Leave a comment

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

New 6m-20m, 6-band Hen-Delta DX Antenna R&D Project

Email from John Hackett AE0EN:

I have recently uploaded a PDF which adds remote multi-band capability to a caged Hen-Delta antenna. It's a great DXing antenna! The link is: <https://archive.org/details/caged-hen-delta-antenna>

See Appendix-5. The 113-page PDF represents more than two years of personal R&D (it is a non-commercial project).

Very few people know about the nice qualities of the skeleton-slot class Hen-Delta. If you find it interesting you might mention the PDF to your readers.

Comments and suggestions welcome!

Abstract from the PDF:

This paper represents my 2-year exploration of the relatively unknown 'skeleton slot' Hen-Delta antenna. This is a versatile 'little' loop antenna with a tiny turning radius, surprising DX performance, and stunning broadband qualities when caged – definitely worthy of study by all amateurs, but especially those who live in noisy cities or suburbs where permanent masts and towers are not permitted, or who simply prefer 'stealthy' – or low cost – DX antennas. I think you will find the caged Hen-Delta an intriguing design... and I hope you will share my enthusiasm for it!

Introduction paragraph about an earlier version of this article from [AE0EN's QRZ page](#):

Much of this page is about my recent experimentation with a novel, one wavelength, narrow-delta antenna called a '**Hen-Delta**'. It is a modification of the Japanese rectangular '*Hentenna*'. 'Hen' is Japanese for 'strangely interesting', partly due to the fact that while mostly a vertical geometry it produces horizontally polarized transmissions. Being narrow, it has a tiny turning radius (2.5' for 10m) and can be hoisted high up into a tree with a rope and pulley system. It can also be simply steered using various home-built mechanisms. The Hen-Delta is bi-directional, **very quiet**, and offers **~6dB of azimuth gain (predicted and observed during rotation)**, although the **signal-to-noise ratio improvement + gain** relative to my 80m horizontal loop can be *much* higher, about 13 dB, as discussed later. The study of this antenna becomes more expansive and detailed over time and section by section below.

I could only allocate time to skim this richly detailed, remarkably complete article. AE0EN's "... two years of personal R&D" really shows!

Some further observations...

- In the 2020s, for most of us (that can't afford a big plot of land to put up big HF antennas), "stealthy" and compact HF antennas like AE0EN's 6m-20m, 6-band Hen-Delta DX Antenna are going to be the preferred HF antenna format.
- AE0EN mentions that this basic antenna design dates back to a simpler design from the 1950s. It's one of the best parts of Amateur Radio that we're still experimenting with antenna designs, especially for HF.
- AE0EN's "article is easily a book length treatment of this unique antenna. Rather than submitting it as a potential book, AE0EN chose to make it publicly, freely available, and I applaud that decision. Trying to get it published in a book is a trying process, even if self-publishing. And if not self-publishing, a *trying* process becomes an arduous, long *grind*.
- But what I really love about AE0EN's article is that he chose to make it publicly available *through the Internet Archive for primary distribution*. With primary articles like this, Digital Library of Amateur Radio & Communications has really arrived as "Amateur Radio's worldwide library".

###

[Need a High Power Rig for Your DigiPi?](#)

Dave Christensen KD7UM on the DigiPi email list:

Here is something I found out yesterday. A couple years ago I purchased a Btech UV-50X2 Mobile radio for my "Event Radio". This is a 50 Watt VHF/UHF radio with four channels of concurrent receive making it useful when needing to monitor multiple frequencies at the same time.

It came with a RJ45 "Y" cable that splits the mic jack into a copy of the Mic jack AND a Kenwood K1 connector that is so popular with Chinese and other HT radios. By setting one parameter on the radio (#61 Ear) to [ON] you get all the connections in the K1 connector to control this radio.

I use the USB AIOC adaptor plugged into the "Y" cable DigiPi is very happy with this radio. I turned down the squelch level to allow weaker received signals to be decoded.

I thought you might want to know.

"AIOC" is [All-in-one-Cable](#) which is supported as an audio and Push To Talk interface in the latest, and future versions of [DigiPi](#).

KD7UM's suggestion is a neat hack instead of going to the work of creating a dedicated cable for speaker, microphone, and push to talk connection for another audio interface. Not to mention the tiny form factor of an [AIOC](#).

###

XetaWave - Vendor of Made In USA 217-222 MHz Data Radios

From the [XetaWave website](#):

Founded in 2010, XetaWave is the largest independent U.S. manufacturer of wireless software-defined radios (SDRs). We're the ideal partner for companies that want to institute industrial automation through the deployment of high-performance wireless technologies.

I was not previously aware of XetaWave. This mention was particularly interesting given my recent realization that the US had better get a lot better about developing much more radio technology expertise for US radio technology use by US companies and individuals:

IN-HOUSE MANUFACTURING

XetaWave is the only company whose SDR products are 100% designed, manufactured, tested, and supported in-house at its headquarters in Louisville, Colorado. Each product is the result of precision engineering and assembly on our state-of-the-art ASM (formerly Siemens) robotic manufacturing line and has been vigorously tested to guarantee functionality over the full operational temperature range of -40° to +75°C.

Sounds like XetaWave is ahead of the curve on this issue. Of more immediate interest to Amateur Radio, XetaWave is one of the few manufacturers to produce radios, especially data radios, and unique (that I am aware) of doing so in the US, including:

[XETA2](#)

- High Speed Over-the-air data rates from 9 kbps to 960 kbps plus higher throughput with payload compression and EMP.
- Dual Mode Duplex and simplex operation.
- Adjustable RF Output Power output up to 5 Watts (+37 dBm).
- Network Types Point to Point, Point to Multipoint, Enhanced MultiPoint, and Peer to Peer.
- Selective Modulation Multiple MSK, PSK, and QAM modulations.

This radio is available in XetaWave's [Debian Industrial Ethernet Radios](#) (enclosure) and [OEM Industrial Radios](#) (board) form factors.

Those attributes would be ideal for the Amateur Radio allocation on 219-220 MHz and might provide a physical proof of concept for [Open Research Institute's recent work](#) (also, see item below) to update the current Part 97 regulations for that band to the point of that band being usable for long range data links.

Given the proximity and being in the same or similar industries, there almost has to be some shared history between XetaWave and [Freewave Technologies](#) in Boulder, Colorado.

My thanks Brian Webster N2KGC for mentioning XetaWave. N2KGC is a trusted advisor to Zero Retries.

###

[Connecting the Dots: Protecting and Improving Amateur Radio Access to 219-220 MHz](#)

Open Research Institute website:

ORI has been actively participating in the FCC regulatory process with proposals that would streamline operations while maintaining necessary technical safeguards. We have spoken up about removing the outdated and [burdensome] notification and permissions requirements for amateur radio stations operating on 219 MHz. See <https://www.openresearchinstitute.org/2025/04/01/fcc-filing-for-219-mhz-rules-changes-from-ori/>

Our most recent comments go further than this, and support removing regulations requiring interference studies to protect television channels 10 and 13 (this is also supported by AAR and WISPA) along with reiterating the elimination of all of the outdated notification requirements in Part 80 and Part 97.

ORI went on to endorse [my comments regarding 219-220 MHz](#) (delete the 100 kHz Bandwidth Limit) in Docket GN 25-133:

Furthermore, we support Steven K. Stroh's recommendation to delete 97.307(f)(13) which restricts amateur station emissions in 219-220 MHz (hereafter "219") from using more than 100 kHz of bandwidth.

Thanks ORI - it's nice to be noticed!

ORI is staying busy with this issue and it's admirable that ORI is being *proactive* about gaining (or restoring, depending on your perspective) Amateur Radio capabilities in 219-220 MHz.

#

[Using Direwolf to Emulate a Host Mode TNC?](#)

John Langner WB2OSZ in the direwolf email list:

This thread was started a long time ago but has some recent activity.

On Fri, Sep 16, 2016 at 03:46 PM, John Huggins wrote:

As I understand it, DireWolf doesn't perform any hostmode functions and perhaps never should. If true, is there a program that can run in the Linux regime to perform just the host AX.25 management functions plus serve as go-between the DireWolf modem and the network port/BPQ32?

The original TAPR TNC was designed for a human operator sitting at a dumb terminal. Text going to the TNC could be either a command to the TNC or text to be transmitted.

Text coming from the TNC could be a response to a command, monitored data, data received from connected station, or status such as the other station disconnected.

Once people started writing applications, to talk to the TNC, it became very clear this was a very bad interface for computer application. Everything was jumbled together in a single text stream rather than separating command, status, and different types of data.

One approach taken was KISS. The TNC just shoveled packets back and forth without adding any intelligence. The higher level processing was done in the computer. For the connection oriented protocol to work well, it needs to know about:

- Channel status (i.e. data carrier detect from the modem & whether transmitter is on.)
- Length of the transmit packet queue.

Among other topics, I rambled on about why using KISS for connected mode packet is a really bad idea here:

<https://github.com/wb2osz/direwolf/blob/master/doc/Why-is-9600-only-twice-as-fast-as-1200.pdf>

The WA8DED Host Mode keeps the connection oriented protocol processing in the TNC, where it has information about channel and transmit queue status. (Back then they referred to it as the AX.25 Link level but nowadays we would call it the Transport layer.) A new interface was provided which separated the commands, status, and different types of data, making it more appropriate for use by a computer application.

direwolf implements the AX.25 connection oriented protocol. As an extra bonus, it implements AX.25 version 2.2 (1998) while most others are still using the less efficient version 2.0 (1984). This is accessible by the AGW protocol over TCP. From the documentation, it looks like BPQ32 can talk to a TNC using AGW protocol. You should be able to use:

```
[RADIO]---audio---[R-Pi:DireWolf/AGW]---TCP---[PC:Linux&BPQ32]
```

The Packet Radio KISS mode was an expedient hack when we first began experimenting with TCP/IP over Packet Radio. The networking functions of TCP/IP could not be done with stock TNC firmware (AX.25 Level 2 Version 2). So, to get some experimentation started, "KISS mode" (or dedicated KISS ROMs) was developed. The very strong (and reasonable) expectation of the KISS developers at the time was that better "radio interfaces" would soon come along (but they didn't...). And thus KISS, like so many other hacks, has endured and become embedded into past, current, and probably future Amateur Radio systems.

#

[Streaming Video via HF](#)

Jeff Davis KE9V on his blog:

Reticulate Micro, Inc., a software products company specializing in advanced video compression and streaming solutions, [announced](#) Reticulate Micro's VAST Video Platform achieved a breakthrough in military communications by successfully streaming video over a High Frequency (HF) radio link from Tucson to San Diego at ultra-low bandwidths of 10kbps to 100kbps. This breakthrough enables live video transmission in bandwidth-constrained and remote environments where such capabilities were previously unattainable.

HF radio refers to radio waves in the frequency range of 3 to 30 MHz. HF radio is known for its ability to provide long-distance communication by bouncing signals off the ionosphere (a process called skywave propagation). This makes it valuable for military, maritime, aviation, and emergency communication, especially in remote areas where satellite or internet-based communication may be unavailable.

If true, wow!

I'm sure this was done with considerably greater resources than what we're going to have access to with the [IP400 Network Project](#) (on VHF / UHF) but one goal of IP400 is to be able to do digital video, and the minimum data speed intended for IP400 is 100 kbps. Perhaps this will mollify the "but... but... but..."ers. On second thought, probably not.

My thanks to Zero Retries Pseudostaffer KE9V for spotting this. He's earned his "pay" for the month (Thanks Jeff!).

###

Good Story About DigiKey Amidst Tariff Chaos

Good story about DigiKey and its history of supplying small quantities of parts, and its origin story in Amateur Radio. New Hampshire Public Radio:

[A small U.S. town grew a big company. Can it weather the tariff blizzard?](#)

THIEF RIVER FALLS, Minn. — Every few nights, Teri Ivaniszyn jolts awake, her mind racing. She never expected to be a tariff expert, but here she is, keeping a notepad by her bedside for groggy 2 a.m. math on how her company can stay in business.

"I wake up in cold sweats about tariffs," Ivaniszyn says. It's a new thing, and she laughs about it.

Her employer is the biggest tech giant you've likely never heard of. DigiKey is a bit like Amazon, but for millions of electronic parts shipped to engineers worldwide — all from a single warehouse here in rural Minnesota.

Recommended! This is great first hand "in the trenches" journalism that digs into the real world craziness that the US finds itself in 2025. Imagine the chaos and disruption this is causing to the myriad small manufacturers of Amateur Radio units here in the US (and trying to get Amateur Radio units from outside the US *into* the US).

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My ongoing *Thanks* to:

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Jack Stroh, Late Night Assistant Editor Emeritus

Shrek Stroh, Late Night Assistant Editor In training

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Footnotes for this Issue

To see the relevant sentence for the footnote, just click the footnote number.

[1](#)

Of course, such a thing can also be done with Microsoft Powerpoint, but the last time I attempted to do so with Powerpoint (years ago, and probably multiple versions ago), it was way too complex and fussy to be usable *to me*. When I shared this realization with my techie daughter Merideth KK7BKI, she cracked "*What? An Apple product that just works and is easier to use than a Microsoft product?*" That joke probably works better when I mention that I still consider myself a Mac convert, but Merideth is a lifelong Mac user.